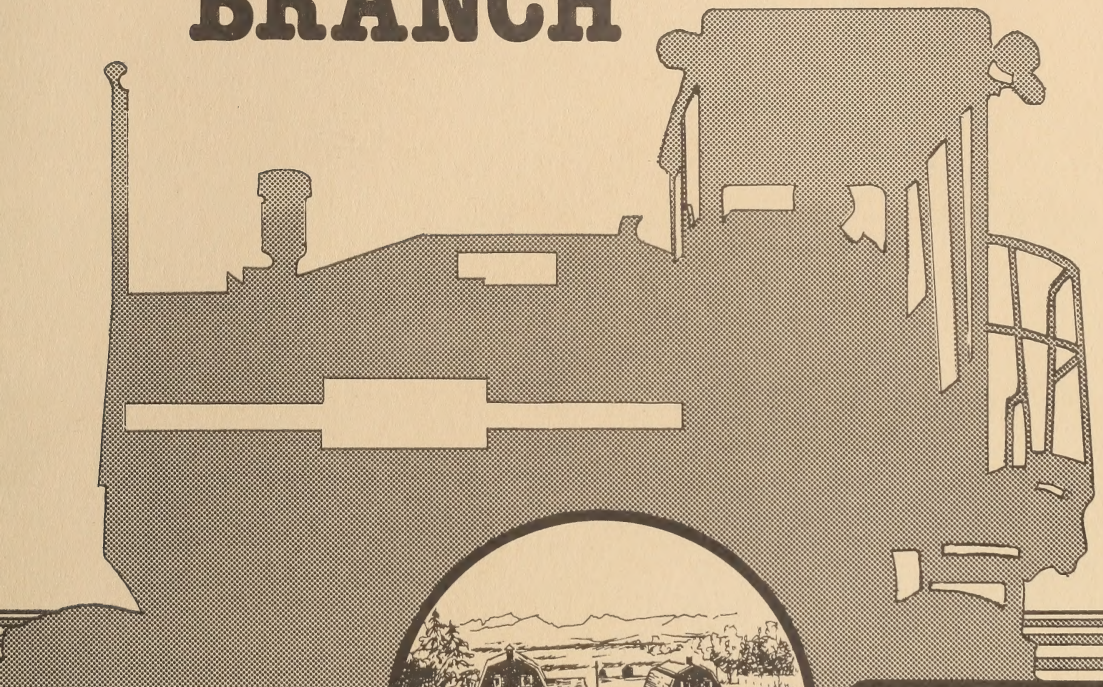
HC.2.1982 21

CANADIANA
c2
MAR 20 1984

PRODUCTION AND RESOURCE ECONOMICS BRANCH



DON5322715

Alberta
AGRICULTURE

Digitized by the Internet Archive
in 2017 with funding from
University of Alberta Libraries

https://archive.org/details/productionresour00albe

TABLE OF CONTENTS

SECTION	PAGE
BRANCH PERSONNEL	i
DAIRY	
Economic Efficiency of Alternative Milking Systems	1
Economics of Milk Production in Alberta, VOL.42, 1982	1
POULTRY	
Economics of Egg Production in Alberta, 1983	3
Economics of Light Turkey Production in Alberta, 1983	3
Economics of Broiler Production in Alberta, 1983	4
Economics of Heavy Turkey Production in Alberta, 1983	4
LIVESTOCK	
Economics and Environmental Considerations in Evaluating Alternative Manure Management Systems	6
Economics of Finishing Hog Production in Alberta, 1982	7
Economics of Farrow-Finish Hog Production in Alberta, 1982	7
Economics of Farrow-Wean Hog Production in Alberta, 1982	8
Economics of Sheep and Lamb Production in Alberta	9
CROPS & LIVESTOCK	
The Vermilion Regional Farm Enterprise Research Project - 1982	11
The Barrhead Regional Farm Enterprise Research Project - 1982	12
CROPS	
A Cost Comparison of Conventional Implements, Airseeders and Aircraft for Seeding, Spraying and Fertilizing	13
Regional Analysis of Crop Production Costs - 1983 Case Study	15
Farm Machinery Costs - 1982	15
SPECIAL CROPS	
The Economics of Sugar Beet Production - 1982	17
The Economics of Production and Marketing of Greenhouse Crops in Alberta	18
TRANSPORTATION	
Energy Use for Farm Trucking in Alberta	20
Agriculture Transportation - Quarterly Review	21
Grain Handling and Marketing Newsletter	22
Impact of Reforms in the Statutory (Crow's Nest) Rates on Commercial Trucking for Transporting Grain	22
Economics of Three Axle Trucks for Hauling Agricultural Products	23

LAND RESOURCES
Potential for Agricultural Expansion Relative to Forestry in Northern Alberta 24
Towards the Determination of an Economic Multiplier . . . 24
The Impact of Obstacles on Farm Operations. 25
Rangeland Improvements: Procedures Costs and Benefits . . 26
Dryland Salinity - The Economics of Control and Reclamation 27
Economic Analysis of Agricultural Liming. 28
Conversion of Woodland to Cropland on Established Farms in Alberta: An Economic Analysis. 28
An Inventory of Changes in Alberta's Agricultural Land Base - 1981 29
Economic Analysis of Summerfallow Reduction 30
Agricultural Real Estate Values in Alberta. 30

WATER RESOURCES
Irrigation Water Requirements in the South Saskatchewan River Basin: Economic Component 32
The Economics of Agricultural Drainage: Irrigated Soils in Southern Alberta 33

PRODUCTION AND RESOURCE ECONOMICS PUBLICATIONS 34

BRANCH PERSONNEL

OBJECTIVES

The two main objectives of this branch are:

- To provide farm clients with information on farm inputs, yields, costs and returns so that they can use their farm resources in the most economically efficient manner to achieve their individual farm goals.
- To provide policy makers within and outside Alberta Agriculture with resource economics information that would enable the province to allocate its scarce natural resources to meet agricultural goals in the most economically and socially efficient manner.

MAJOR AREAS OF RESPONSIBILITY

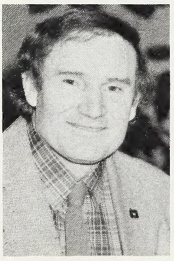
DR. CARLYLE ROSS
Branch Head

- Supervises a provincial research program into the economics of livestock production, primarily beef, sheep, hogs and poultry.

MR. LLOYD ANDRUCHOW
Agricultural Economist

- Supervises and administers a provincial research program into the economics of crop production, primarily cereals, oilseeds, special crops and honey production, and farm machinery costs.

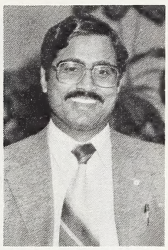
MR. RUDY SUSKO
Agricultural Economist



- Supervises and administers a provincial research program into the economics of dairy production, milk pricing and other supply management sectors of agriculture.

MAJOR AREAS OF RESPONSIBILITY

MR. G. NABI CHAUDHARY
Agr. Transportation Econ.

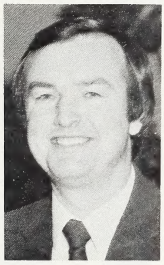


- Supervises and administers a provincial transportation research program, extending to transportation issues world-wide; provides an information service on transportation costs for agricultural commodities shipped by road, rail, air and water. Also responsible for research regarding the economics of vegetable and horticultural crop production.

MS. ANITA MARR
Agricultural Economist

- Administers a provincial research program primarily related to the economics of beef cattle and sheep production.

MR. LEN FULLEN
Systems Economist



- Supervises and administers a provincial research program related to the economics of alternative agricultural production systems, such as forage handling systems, livestock feeding systems, waste management systems, alternative cropping systems, etc.

MS. ANNABELLE BOYDA
Agricultural Economist

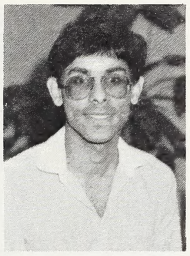
- Administers a provincial research program primarily related to the economics of hog and poultry production.

MAJOR AREAS OF RESPONSIBILITY

MR. ALLAN PRESIZNUK
Research Assistant

- Assists in data collection and analysis primarily in the areas of dairy production and farm machinery costs.

MR. REYNOLD JAIPAUL
(On Contract to June/84)

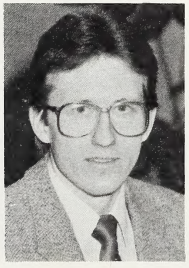


- Primarily involved in the study of sugar beet production in Alberta, including qustionnaire review, preliminary analysis of raw data and writing of report. Assists in the analysis and write-up of several crop production studies including the Regional Farm Enterprise Research Projects in the Vermilion and Barrhead Regions.

MS. KATHLEEN MACDONALD
Resource Economist

- Supervises and administers a provincial research program related to the economics and management of land resources.

MR. PETER WOLOSHYN
Resource Economist



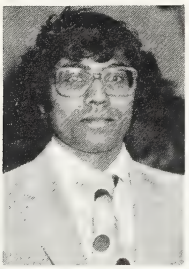
- Administers a research program related to the economics and management of land resources.

MAJOR AREAS OF RESPONSIBILITY

MR. RON DESJARDINS
Resource Economist
(Educational Leave)
to June/84

- Administers a research program related to the economics of water resource use and management. Also evaluates the economic impacts of obstacles such as well-sites, powerlines etc. on farming operations.

MR. NITHI GOVINDASAMY
(On contract to June/84)



- Conducting an economic study of dryland salinity, its control and reclamation. Also involved in review of irrigation cost-sharing agreement in Alberta.

MS. ALISON COYNE
Contract to June/84)

- Working on a benefit/cost study of clearing bush for farming in Alberta.

MR. ANDREW KAGGWA
(On Contract to June/84)

- Working on a benefit/cost study of liming acid soils in central and northern Alberta.

BRANCH CLERICAL SUPPORT:

DEB BOSSE SHELLEY COLE

SHIRLEY SOMMERT

The following report is a compilation of summaries of research projects either recently completed or in progress within the Production and Resource Economics Branch.

Published copies of production economics reports are available through the Print Media Branch at the following address:

Print Media Branch
Alberta Agriculture
7000-113 Street
Edmonton, Alberta, T6H 5T6
OR
Alberta Agriculture's district offices.

For additional information on production economics publications call 427-4005. Resource economics publications may be obtained by calling 427-4026.

D A I R Y

ECONOMIC EFFICIENCY OF ALTERNATIVE MILKING SYSTEMS

Len Fullen & Rudy Susko

Background and Objectives

Selection of the best milking system often presents a dilemma for a dairyman who is remodelling, expanding or building a new dairy farm facility. The dilemma stems from the large number of systems available today and their differences in capital requirements and possible labour efficiency.

The overall objective of this study is to identify least - cost milking systems for Alberta dairy operations. Specific objectives are:

1. to identify capital investment requirements to purchase new milking parlor systems and equipment,
2. to identify labour requirements associated with various milking systems for several herd sizes, and
3. to develop per-cow milking system costs for various herd sizes.

Method:

Information relating to capital requirements for constructing new milking systems was obtained from several companies across the province who sell and install milking facilities and equipment.

To determine labour efficiency etc., a list of dairy farmers was obtained from the Dairy Herd Improvement Program of Alberta Agriculture. From this list, producers were classified according to the milking system on their farm. Each producer was then telephoned to see whether he would assist us with the study.

Initially we hoped to have seven or eight producers on the study for each system. However, it soon became apparent that there were not seven or eight producers using each of the systems we had identified.

The analysis therefore looks at the relative efficiency of seven parlor configurations and two types of stanchion barns that use either bucket or pipeline milk collection methods.

Expected Completion Date: May, 1984

ECONOMICS OF MILK PRODUCTION IN ALBERTA VOL. 42, 1982

Rudy Susko

This study is an economic analysis of milk production in Alberta at the farm level. The study is carried out annually and, in its original form, was initiated in 1940.

Method:

Fifty-seven dairy producers across the province submitted business information for the calendar year of 1982. In order to obtain accurate dairy information, all producers on the study are required every month to complete a detailed questionnaire each month for their dairy production activities. The most important benefit of this procedure is promptness in data collection and a minimum of recording error. The information is entered from the input sheets into the computer.

Results:

The study provides a continuing account of the costs and economic conditions in production of milk in Alberta for the Dairy Control Board, Public Utilities Board and dairy industry as a whole. It also provides the participating producers with a personal business analysis. The cost of production of milk is a vital economic indicator in milk pricing since dairying is a supply and price regulated industry.

The actual cost of producing one hectolitre of milk in 1982 was $39.20 down 1.5 per cent over 1981. The Northern Alberta average was $38.71, while the Southern Alberta average was $39.53. The average return to equity on Alberta dairy farms was 12.0 per cent, with a debt/-equity ratio of 0.39.

Completion Date: May, 1983

P O U L T R Y

ECONOMICS OF EGG PRODUCTION IN ALBERTA, 1983

Rudy Susko

The national wranglings over egg pricing in recent months has significantly intensified. The findings of the National Farm Products Marketing Council (NFPMC) public hearings indicate that one of the alternatives in setting the price of eggs is using the provincial cost of production information. It is therefore imperative that a provincial cost study be undertaken to generate the information in question.

Method:

A random sample of egg producers has been selected to provide economic data for the 1983 period. The average size of operation on the sample is 6,000 birds which should reflect the industry's average size. A computer program has been developed to facilitate the analysis.

Expected Results:

The study will provide an account of the cost and economic conditions encountered in the production of eggs in Alberta, which hopefully will be of benefit to the Board and the egg industry as a whole. It will also provide the participating producers with a personal business analysis, useful in management decisions.

Expected Completion Date: May, 1984

ECONOMICS OF LIGHT TURKEY PRODUCTION IN ALBERTA, 1983

Carlyle Ross & Annabelle Boyda

Background:

Presently in Alberta, light turkey production is under supply management through quota allocation. Fourteen turkey broiler producers were allocated quota. The quota recently switched from a bird to a weight basis. Most producers are on a cyclical program which allows maximum utilization of facilities. The schedule for replacement is approximately 16 to 17 weeks. This segment of the poultry industry has potential for growth. This report attempts to determine the physical relationships of inputs and output in broiler turkey production, as well as, the returns and costs associated.

Method:

Fifty per cent of the producers were selected to participate in this study. The producer list was obtained from the Alberta Turkey Growers' Marketing Board, and selection was targeted to include a range in quota size. Each producer was interviewed individually to obtain the detailed data.

Results:

The results will indicate income, direct costs, overhead costs, labour costs and capital costs associated with broiler turkey production on a provincial and size class basis. Productivity, labour, feed conversion and investment will also be examined. The results will also be

expressed as dollars per bird produced and dollars per flock. The participants will be provided with the personal business analysis of their operation and have an opportunity to compare their operation with the group averages.

ECONOMICS OF BROILER PRODUCTION IN ALBERTA, 1983

Carlyle Ross & Annabelle Boyda

Background:

The broiler industry in Canada has developed highly efficient methods of production. Producers are now able to provide the finished product on the market fairly rapidly. With improved breeding and better developed rations the product achieves optimum weight in minimal time, 6½ to 7 weeks of age. Because the right growing conditions are provided, producers are able to supply a competitive meat for consumers. In Alberta, licences to grow and market broilers must be obtained through the Alberta Broiler Growers' Marketing Board. The Alberta growers recently agreed to sign an agreement with the Canadian Chicken Marketing Agency limiting total 1983 marketings to 78 million pounds. This agreement will limit marketing opportunities. This report will examine the returns and costs of production of broilers in 1983. It will also determine the level of investment involved and the inputs in the industry.

Method:

A list of broiler producers was obtained from the Alberta Broiler Growers' Marketing Board. The random selection of 30 participants was stratified by quota size and represents 20 per cent of the total producers. The participants will be individually interviewed and required to provide detailed information about their enterprises. Each producer will receive a business analysis of his operation and have the opportunity to compare their performance to the averages for Alberta.

Results:

The results will indicate the gross income, direct costs, overhead costs, labour costs and capital costs associated with broiler production. They will include averages, not only provincial, but for different sizes of operations, regions and levels of management as well. Productivity, labour, feed conversions and investment levels will also be examined.

ECONOMICS OF HEAVY TURKEY PRODUCTION IN ALBERTA, 1983

Carlyle Ross & Annabelle Boyda

Background:

The Canadian Turkey Marketing Agency is the body in charge of supply management through quota allocation. The industry itself has undergone some change in recent years. In 1982 a new cost of production formula was proposed. Alberta producers felt that this formula did not realistically reflect the Alberta situation, particularly in the area of the feed conversion ratio's and feed costing methods. In 1983, the bird quota basis switched to a weight basis. The quota allocation for turkeys in Alberta for 1983 was 8.26 million kg. This report examines the level

of investment in the heavy turkey industry and attempts to determine the returns and costs associated with heavy turkey production in Alberta.

Method:

A list of current heavy turkey producers were obtained from the Alberta Turkey Grower's Marketing Board. The random sample selection consisted of 15 participants which represented 33.3 per cent of the heavy turkey producers and 25.4 per cent of all turkey producers in Alberta. This sample was stratified by quota size. Producers were individually interviewed on farm, using a detailed questionnaire.

Results:

The average returns and costs will be presented on a regional and provincial basis. The results will be expressed as dollars per bird produced and dollars per flock over the 1983 production year. Certain management factors were taken into consideration and used as a basis for grouping participants into either low, medium and high management categories. The management indicators used consisted of grade performance, return to equity expressed as a ratio over operator and family labour hours, feed costs, and investment, and the final indicator was the actual production cost per bird produced. Each management group average examines the returns and costs involved, as well as the average years of farming, productivity, feed conversion, mortality estimate and percentage of condemned.

ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS IN EVALUATING ALTERNATIVE MANURE MANAGEMENT SYSTEMS

Len Fullen

Background:

Most research papers, brochures and journal articles refer to livestock and poultry manure as waste - a carryover from the days when manure was considered a nuisance to be disposed of in the cheapest way possible. However, as petroleum-based fuels and fertilizers escalate in price, manure is no longer being viewed simply as a waste product. Instead, manure is being increasingly considered as a resource, to be utilized as efficiently as possible.

The trend toward larger, more specialized livestock and poultry operations, often on small land bases, has resulted in the production of great quantities of manure to be utilized or disposed of every year.

Technological advances have developed alternative uses for manure, such as methane production, refeeding, or composting. The question often asked by producers is whether these alternatives would be feasible for their own business.

Objectives:

The objectives of this report were:

1. To demonstrate the value of manure - both in nutrient content and as a soil conditioner - so that livestock and poultry producers might utilize it in some manner (depending on their particular situation) that will provide higher net returns to their overall farming or feeding operations.
2. To attempt to provide information, as a result of research and discussions with users of various manure handling systems, to assist producers in sorting out the many factors to be considered when selecting the most suitable manure handling system, or components of a system, for a specific livestock or poultry operation.
3. To provide a brief overview of alternative manure management systems which are, or may be applicable to Alberta conditions;
4. To supply comparative cost guidelines for these systems so that producers who are considering modification of their present manure handling methods will have something to follow in developing a manure management system for their particular situation;
5. To review the current "state of the arts" with regard to farm-scale composting of manure, methane production and refeeding of livestock or poultry manure. This section of the report will provide some cost guidelines as well as look at the potential of these manure handling methods as alternatives to land application of raw or decomposed manure to provide higher net returns to the livestock and poultry industry, and to reduce environmental pollution problems.

Method:

A detailed cost analysis of alternative manure handling systems typically found in livestock and poultry operations in Alberta is not

included in this study. Rather, the study examines (a) the quantity and potential value of manure based on its nutrient content, (b) environmental impact of alternative uses for manure and (c) possible benefits and costs associated with alternative methods of utilizing manure.

Expected Completion Date: May, 1984

ECONOMICS OF FINISHING HOG PRODUCTION IN ALBERTA, 1982

Carlyle Ross & Annabelle Boyda

Background:

A three-year study examining the cost of hog production in Alberta was initiated in 1980. The first report was based on data collected for the 1980 production year and described both farrow-finish and finishing enterprises. The data collected for the 1981 production year described the two enterprises in separate reports. This report looks at the economics of finishing hog production for the 1982 production year. It examines the level of investment associated with this enterprise and determines the inputs used and quantities required. The costs and returns, profitability and relative productivity of finishing production were also estimated.

Method:

A random selection of over 200 producers names was obtained from the APPMB. Of these participants, 57 were finishing producers. Each finishing producer was interviewed on his farm, where he provided detailed information about his hog finishing enterprise. Each producer received an analysis of his operation, plus regional and provincial averages with which to compare his performance.

Results:

This study provided an overall provincial perspective of the economics of finishing hog production, and also compared production by region, size of operation and level of management. Over the three years under review, finishing hog production was only profitable in 1982. Profitability varied from a loss of $8.12 per hundredweight of dressed pork produced in 1981 to a profit of $1.37 per hundredweight in 1982. The average hog investment per farm in 1982 was $70,740 or $114.10 per hog marketed. As with profit, return on investment was negative in 1980 and 1981, and positive in 1982 at 4.28 per cent. The top producers, almost one-quarter of the sample, earned profits of $15.86 per hundredweight of dressed pork produced in 1982 and return on investment of $34.6 per cent.

Expected Completion Date: September, 1984

ECONOMICS OF FARROW-FINISH HOG PRODUCTION IN ALBERTA 1982

Carlyle Ross & Annabelle Boyda

Background:

Hog production in Alberta is now an industry in its own right. In 1983 it contributed 12 per cent to total livestock receipts and 5.4 per cent to total farm receipts. Given the abundant feed supplies here in

Alberta and the loss of traditional markets in eastern Canada, questions have been raised regarding the natural comparative advantage of pork production in Alberta relative to other competing jurisdictions, and the long term viability of the industry. This three-year study which commenced with the 1980 production year, examines the economic returns and costs of hog production, as well as the relative productivity and profitability in the province.

Scope:

The study is provincial in scope with provisions for regional and size groupings. Both farrow-finish and finishing operations are studied over the three-year period. However, farrow-wean enterprises were only examined in 1982 and will be evaluated in 1983 and 1984. This report confines itself to farrow-finish enterprises.

Method:

Over 200 producers were randomly selected from a list of producers who marketed hogs through the APPMB in 1980. The sample was stratified by size of marketings and regional location. Additional names were obtained in 1981 and 1982 to maintain sample size. All participants were interviewed on their farms using a detailed questionnaire.

Results:

Farrow-finish enterprises, the backbone of the industry, were decidedly more profitable than finishing enterprises. Over the three year period, profitability of farrow-finish enterprises varied from a low of 16 cents per hundredweight dressed in 1981 to a high of $13.77 per hundredweight in 1982. In contrast, finishing enterprises showed losses in 1980 and 1981, and a small profit of $1.37 per hundredweight dressed in 1982. Similarly, return on investment for farrow-finish enterprises ranged between 9.24 per cent in 1981 to 13.90 per cent in 1982, versus negative returns on investment for finishing enterprises in 1980 and 1981, and 4.28 per cent in 1982. Indeed, in 1982, top farrow-finish managers showed returns on investment of 24.5 per cent and profits of $24.43 per hundredweight of dressed pork produced.

Conclusion:

The hog industry is becoming increasingly modernized. Operators are fairly young, 42 years, and progressive. However, the potential exists for increasing profitability by increasing the number of piglets weaned per sow and hence output, and reducing productions costs. In short, the results clearly demonstrate that it pays to improve management efficiency.

Expected Completion Date: September, 1984

ECONOMICS OF FARROW-WEAN HOG PRODUCTION IN ALBERTA, 1982

Carlyle Ross & Annabelle Boyda

Background:

This study is essentially a spin-off from research into the economics of farrow-finish and finishing hog production in Alberta. Finishing hog enterprises mainly purchase their weaner from farrow-wean operations.

Because finishing enterprises under study showed consistent losses in 1980 and 1981, and given the multiplicity of pricing formulas for weaner pigs, it was decided to examine the economics of weaner pig enterprises and to see how the price of weaner pigs related to production costs.

Method:

There is no readily available list of weaner producers in the province. Consequently, the sample was selected from names provided by farrow-finish and finishing producers who participated in the three year hog study, farm district agriculturalists and anyone who knew of farrow-wean operations. Twenty six enterprises were recruited for the 1982 production year and the results presented are based on these records. All study participants were interviewed on their farms using a prepared questionnaire.

Results:

The first year results should be taken as very tentative. The average farrow-wean herd consisted of 100 sows and five boars. Piglets weaned per sow averaged 15.4, well above the average of 13.9 for farrow-finish operations. Almost 287 pounds of feed were required to produced a 42 pound weaner pig. Feed cost was estimated at 40 per cent of total production cost i.e. $22.34 per weaner equivalent or $321.98 per sow. Over all, the enterprises showed losses of 16 per cent i.e. $8.18 per weaner equivalent or $117.94 per sow, despite receiving average prices of $48.85 per weaner. Average return on investment was negative 1.79 per cent.

ECONOMICS OF SHEEP & LAMB PRODUCTION IN ALBERTA

Carlyle Ross & Anita Marr

Background:

Sheep production in Alberta constituted approximately 18 per cent of Canadian production in 1981. Approximately 30 per cent of the mutton and lamb annually consumed is produced in Canada with the remainder being imported from New Zealand, Australia, and the United States. A tremendous potential for expanding the sheep industry within Canada, particularly in Alberta, seems apparent when analyzing the difference between mutton and lamb consumption, and production. A comprehensive study of the Alberta sheep industry is currently in progress with the objectives being to determine various sheep management systems, levels of capital investment, production inputs and costs, major constraints and profitability.

Method:

Study participants were randomly selected from a list of the 1,566 sheep producers who took part in the 1982 Alberta Beef, Cattle and Sheep Support Program. A stratified random sampling procedure was used to select 200 producers according to the number of ewes on the farm in 1981 and the location of the farm. All study participants were interviewed on their farm using a prepared questionnaire. The results which follow are based on 165 completed questionnaires.

Results:

The detailed farm records required for this study were very deficient. Consequently the results of this 1982 production year, the first year of the study, should be viewed as very tentative.

The preliminary results show an industry very much in retreat. Several enterprises being studied went out of business in 1983. The estimated returns and costs for 1982 clearly illustrate the problem.

Sheep producers reported gross income averaging 89 cents per pound live weight or $100.21 per ewe. However, the estimated gross margin or return over cash cost was only four cents per pound live weight or $5.22 per ewe. The average investment of $718 per ewe showed negative returns of 6.6 per cent. Only enterprises with flocks of 500 ewes or more broke even in 1982; profit was estimated at one cent per pound live or 88 cents per ewe.

THE VERMILION REGIONAL FARM ENTERPRISE RESEARCH PROJECT - 1982

Lloyd Andruchow

Background:

The Regional Farm Enterprise Research Project was developed to help the agricultural producer analyze his farming operation using the enterprise approach. Implementation of this project first occurred in the Vermilion Region in 1979, and has since provided actual costs and returns information for the major agricultural enterprises. The project has provided invaluable input/output and costs/returns data for extension field staff, agri-business, and headquarters staff.

Methodology:

The Vermilion Region is predominantly a mixed farming area with most farmers undertaking an enterprise mix in order to maximize their farming income. The fifty farms that participate annually in this project were selected on the basis of their main farming enterprise. To ensure representation from all of the twelve agricultural districts, the regional economist and district agriculturists were asked to select the participants for the desired enterprises. The recording of data necessary for a complete analysis was achieved by way of personal visits made at the end of each study year. Following a computerized analysis of the raw data, individual results were mailed to each participant and reviewed, particularly with beginning farmers and first time study participants.

Results:

In general, yields from grain and oilseeds showed an increase in 1982 versus 1981, but due to weaker prices, brought little change to their net returns per acre. In fact, net returns per acre decreased in 1982 as production costs continued to rise. Operating costs which include all "out-of-pocket" costs and depreciation increased approximately 19.6 per cent in 1982 over 1981. It was observed that yields for the three main crops grown - barley, wheat, canola - were lower on rented land despite higher material costs. Generally speaking, per acre production costs were lower on rented land since the cash rent/crop share value was lower than the interest cost charged on the market value of owned land. As to economies of scale in grain production, the relatively larger farms in 1982 had significantly lower machine and labour costs, giving them lower production costs per bushel for all major crops surveyed.

Hog production was more or less profitable in 1982 as the eight farms with farrow-finish operations experienced returns to management of $5.18 per market hog sold.

The average cow-calf, cow-calf yearling, cow-calf finish, and cattle finishing enterprises all failed to generate sufficient income to cover their operating costs. Most significant in the cash cost category was the cost of home-grown feed which was valued at the market price.

THE BARRHEAD REGIONAL FARM ENTERPRISE RESEARCH PROJECT - 1982

Lloyd Andruchow

Background:

The Regional Farm Enterprise Research Project, which was initially developed to help the agricultural producer analyze his farming operation using the enterprise approach, was extended into the Barrhead Region in 1981. Its principal goal was to obtain actual production costs and returns estimates for the major crops grown in the Barrhead Region. Participating farmers have been very pleased with the cost analyses they have received, namely, a computerized analysis of each crop enterprise on their farm along with the group average. The project has provided input/output and costs/returns data for extension field staff, agribusiness, and headquarters staff.

Methodology:

Although the Barrhead Region is primarily a mixed farming area, analysis was limited in scope as per request to study only grain operations in the Morinville D.A. district. Based on the criteria of type of crops grown, type of land ownership and size of operation, the district agriculturalist from Morinville selected a total of twelve farms, six of which had 1,100 acres and more seeded to grains and oilseeds. The remaining six farms had less than 1,100 acres seeded to grains and oilseeds. The recording of data necessary for a complete analysis was achieved by way of personal visits made at the end of each study year. Following a computerized analysis of the raw data, individual results along with group averages were discussed with the participants during personal visits.

Results:

Yields for the four main crops surveyed in 1982 - barley, oats, canola, wheat - were similar to those obtained in 1981. Returns per acre decreased in 1982 for barley, oats and wheat as a result of weaker prices but increased for canola. Operating costs for the main crops grown on owned land ranged from $94.15 per acre for barley to $112.21 per acre for canola. Operating costs on rented land ranged from $113.65 per acre for wheat to $123.19 per acre for barley. Returns over operating costs for all crops ranged from (-$6.64) per acre for wheat on rented land to $82.52 per acre for canola on owned land. Returns to management ranged from (-$116.63) per acre for barley on owned land to $7.44 per acre for canola on rented land.

The analysis of production costs by farm size indicated that economies of scale exist in the areas of machine operating and ownership costs, and labour. Larger farms had lower production costs per bushel produced for all crops surveyed.

A COST COMPARISON OF CONVENTIONAL IMPLEMENTS, AIRSEEDERS AND AIRCRAFT FOR SEEDING, SPRAYING AND FERTILIZING

Len Fullen

Background:

Increasing costs for fertilizer, chemicals, fuel, repairs, labour and farm machinery have created keen interest among farmers in new methods of farming that may be more efficient, more economical, or both. Development of new equipment, such as the airseeder and further refinement of equipment such as the ag. aircraft used for applying chemicals, fertilizer and seed, have given the average farmer a lot to consider when deciding how best to produce a crop on his own farm.

Objectives:

The primary objective of the study was to obtain data from farmers using various methods for seeding, fertilizing and spraying to show the advantages and disadvantages of using one system instead of another. The principal systems evaluated were:

a) conventional ground implements for seeding, fertilizing and spraying,
b) airseeders for seeding and fertilizing, and
c) ag. aircraft for seeding, fertilizing and spraying.

Although the main emphasis was on a comparison of ownership and operating costs, questions were also asked regarding the performance or functional aspects of each system.

Method:

To assist farmers in their decision making, farmers using various methods of seeding, fertilizing and spraying were surveyed during the late winter and early spring of 1983.

Participants on the survey were selected in three different ways:

a) District Agriculturists were contacted and asked for the names of three farmers in their district who only used conventional ground implements in their seeding, spraying and fertilizing operations during 1982 and who would likely be willing to assist with the study,
b) equipment dealers were contacted to give us the names of farmers across the province who had experience with airseeders, and
c) aerial applicators were contacted for the names of some of their farm clients who could supply information about seeding, fertilizing or spraying by aircraft.

The questionnaire was divided into three parts. Part A asked rather general questions such as the methods used on the farm during 1982 for seeding, fertilizing and spraying, whether equipment was owned or rented, in what form and at what time of year nitrogen was applied and why one method was selected over another.

Part B asked for agronomic data relating to a specific field of either a cereal or oilseed crop grown on the farm during 1982. Questions were asked regarding variety of crop, acreage planted, seeding date, seeding rate, soil type and texture, growing season rainfall, and yield obtained. Specific questions of this nature were asked so that a

comparison could be made between fields that were very similar but had been seeded, fertilized or sprayed with different types of equipment. We also wanted to be able to note possible reasons for some of the data that would likely appear in Part C, i.e. information regarding the number of times the field was worked prior to seeding, the size and type of equipment used, labour hours and quantities and costs of seed, fertilizers and chemicals.

Results:

Useable data were obtained from 65 farmers for 172 fields of 9 different cereal and oilseed crops. A computer program was developed to assist in analyzing the data. Results show that the capital invested in equipment (tractors and implements) has more influence on costs than does the method of seeding, fertilizing or spraying.

Seeding Costs:

For example, regional data on seeding costs indicated that farmers who had small older model conventional implements had the highest labour costs, but total fixed and variable costs for machinery, tractors and labour were lower than either farms with large, newer model conventional equipment, farms with airseeders or farms using aircraft for seeding. Aerial seeding was second lowest in total costs due to a relatively low investment in equipment and the smaller sized tractors required to incorporate the seed into the soil.

Although farmers with airseeders can reduce their labour costs substantially by covering more acres than a farmer using conventional drills in the same period of time, their total costs equalled or exceeded conventional equipment use depending on the size and value of their tractors and machinery.

Justification of an airseeder system was demonstrated where there was need to cover a large land base in the shortest period of time and the capability of doing two jobs, banding fertilizer and seeding, with one machine.

Aerial application of seed did not appear to be the fastest method of seeding, due to the time required for incorporating the seed if the job is to be done properly.

Fertilizing Costs:

A comparison of airseeders, aircraft and rental of an anhydrous applicator for fertilizing indicated highest costs ($15.00/acre) for airseeder systems (primarily due to the large investment in machinery and big tractors needed to pull the airseeder); mid-range costs ($6.50/acre) for aerial application (5.00 custom charge and 1.50 for tractor and harrowing costs) and lowest costs for anhydrous application (with no money tied up in machinery and only $0.97/acre for tractor costs.

Labour requirements were least with anhydrous application (20.8 acres/hr) followed by aerial application (17 acres/hr) and greatest with airseeder systems (11 acres/hr).

Chemical Application Costs:

Least expensive chemical application appeared to be conventional ground sprayers (between $0.80 and $1.85/acre). Labour requirements were minimal because of the large acreage that could be covered in a short period of time (wide booms and relatively high speed travel); tractor

costs were low since a small tractor could be used, thus avoiding a large investment in equipment.

In comparison, custom aerial charges averaged about $3.50/acre for standard chemical applications.

Completion date: April, 1984

REGIONAL ANALYSIS OF CROP PRODUCTION COSTS - 1983 CASE STUDY

Lloyd Andruchow

Background:

The recently proposed 1983 Case Study has as its major objective the establishment of a current and comprehensive data base for representative crops grown in each Region. This project is expected to complement and not replace the existing Consensus Research Data studies of costs and returns (C.R.D. program) which was designed to meet more specific objectives. The advantage of such a project is that it allows for the collection of actual production costs immediately after harvest as compared to waiting to the end of the calendar year. As such, participants can expect to have their individual results and group averages prior to spring planting. Also, the project will provide extension field staff, agri-business and headquarters staff with a current data base.

Methodology:

Approximately seventy farms are participating in the 1983 Case Study, representing five of the six provincial Regions. Prior to the selection of farms, meetings were held in each of the Regions to discuss the 1983 Case Study proposal and to identify the information needs of headquarters staff and regional extension field staff. With this information at hand, criteria were developed to aid in the selection of farm participants. The district agriculturalists proceeded to contact eligible farmers in their respective areas to verify participation in the project. Staff from both the Production Economics Branch and Regional Districts have been involved in data collection by personally contacting the participants and recording the necessary information required for analysis. Individual results will be personally discussed with the participants.

Results Expected:

The analysis of questionnaires is now in progress with the results being more than satisfactory. It is envisaged that this data will be used in the planning and budgeting phases on participating farms. Also, group average data will be available for each major crop surveyed by soil type thereby adding to the accuracy and representativeness of the data base used by extension field staff.

FARM MACHINERY COSTS - 1982

Lloyd Andruchow & Allan Presiznuk

Background:

The main purpose of this study is to present current costs of owning and operating farm machinery and provide assistance to the farm operator

in the planning and budgeting of machine use. An attempt has been made to provide operating and ownership costs for all types of farm machinery currently used in agricultural production. It provides farmers, research workers, extension personnel and agri-business with a data base and framework for analyzing the economic aspect of farm machinery use.

Method:

Some 66 farm implement dealers representing different manufacturers, and several agri-business firms are contacted throughout the province to obtain list prices for the various equipment used on Alberta farms. The prices shown in this study are average retail list prices, less sales tax. Included in the average retail price is the cost of transportation from place of manufacture to the major distribution points in Alberta. Fuel consumption rates, machinery depreciation factors, and repair formulae developed in Nebraska are used in the calculation of machinery costs. The data presented should be used as an up-to-date guide and users are advised to substitute more appropriate data, if available, to represent their particular situation.

Results:

The study showed that ownership costs were up 25 per cent, while operating costs climbed 75 per cent during the two year period (1980 to 1982). Because the cost of owning and operating farm machinery is surpassed by only farm land costs in farm production, farm managers need to carefully examine the options of renting, leasing, custom hiring and purchasing their farm equipment. The timing of trade-in and the trade-in value of machinery also require careful consideration.

SPECIAL CROPS

THE ECONOMICS OF SUGAR BEET PRODUCTION - 1982

Lloyd Andruchow

Background:

Within the past two years, sugar prices in Alberta have declined fifty per cent. This, when coupled with the thirty per cent increase in production costs during the same time period, has only added to the difficulties facing the average sugar beet grower. Given the importance of sugar beets as a cash crop on irrigated farms, and the increasing concern regarding declining world sugar prices in the face of rising production costs, the Production Economics Branch was approached by the Alberta Sugar Beet Growers' Association to undertake a three year economic evaluation (1981-83) of this crop. The Federal Agricultural Stabilization Board includes sugar beets as a designated product and therefore monitors the returns and cash costs experienced by sugar beet producers.

Methodology:

A total of fifty-one sugar beet growers was selected for study from a list of sugar beet contracts supplied by the Alberta Sugar Beet Growers' Association. The method used for selecting participants involved the stratified random sampling technique, thus, ensuring some representativeness of the entire grower population. Participants were personally contacted after the crop year ending 1982 so as to complete a questionnaire regarding their returns and costs incurred. Following the computer analysis of the raw data, individual results were mailed to each participant.

Results:

Sugar beet yields were down 20.3 per cent in 1982 at 15.18 tonnes per acre compared to 19.05 tonnes in 1981. As such, total returns in 1982 were much lower at $702.64 per acre as opposed to $833.54 per acre the previous year.

Total production costs amounted to $853.29 per acre or $56.21 per tonne. Of this total, cash costs accounted for 54.85 per cent or $468.06 per acre. What still remains the most significant cash cost facing these growers is that of machine operating costs which was $160.63 per acre, representing 34.3 per cent of the total cash costs. This was followed by material inputs namely seed, fertilizer and chemicals at $133.75 per acre.

Overall, the average sugar beet enterprise studied in 1982 showed more losses than in the 1981 crop year. Return over cash costs was down 29.9 per cent in 1982 at $234.57 per acre versus $334.81 per acre in 1981. As returns were insufficient to cover total production costs, the average sugar beet grower showed a loss of $150.67 per acre in 1982.

THE ECONOMICS OF POTATO AND VEGETABLE PRODUCTION IN ALBERTA, 1981 & 1982

Rudy Susko & G. Nabi Chaudhary

Background:

There is a consensus within the industry that Alberta has the potential for greatly expanding production of local vegetables, thereby reducing imports significantly. In keeping with these concerns, representatives of the vegetable and potato industry requested that a study be undertaken to document production costs and returns for fresh and processing vegetables, and potatoes. It was also felt that production costs and return data would assist in establishing prices for these products. A three-year study of the vegetable and potato industry was undertaken in order to develop the required information.

Method:

For the 1981 and 1982 crop years, data on production costs and returns were collected from fifty-three (53) and twenty-one (21) producers, (potato and vegetables) respectively. In 1980, the sample size was 37 potato and vegetable producers. Personal questionnaire survey approach was used for data collection.

Results:

For the 1981 crop year, nine (9) crops were studied including the major fresh and processing vegetables, and fresh and seed potatoes. For the 1982 crop year, only four (4) crops were studied as the number of participants dropped considerably from the previous crop year. The 1981 data showed that cabbage and turnips are the most labour and machinery intensive crops as these costs amounted to well over $1,000 per acre. All of the crops studied and analyzed in 1981 showed positive return over the operating costs. However, five of these crops (cabbage, fresh carrots, peas, processing corn and fresh potatoes) showed negative returns to management ranging from $27.88 per acre for fresh carrots to $112.50 per acre for processing corn. Turnips were the most profitable crop in 1981 followed by seed potatoes and fresh corn.

The 1982 data showed negative returns to management for three crops, namely beans, fresh corn and fresh carrots which ranged from $9.78 per acre for beans to $115.55 per acre for fresh corn. Peas showed a positive return to management of $11.18 per acre in 1982.

The three-year study showed that the size of the Alberta vegetable industry is limited by two major factors, seasonality of production and economic conditions. While the former is difficult to change, the latter provides an opportunity for improvement. The present production capacity of the vegetable industry is far below the demand requirements. Improved management skills could bring about a reduction in overall production costs.

THE ECONOMICS OF PRODUCTION AND MARKETING OF GREENHOUSE CROPS IN ALBERTA

G. Nabi Chaudhary

Background:

This study was undertaken in the spring of 1983 at the request of the Protected Crops Advisory Committee, primarily to up-date information contained in the reports on the greenhouse industry published in 1980 and 1981. It was further asked that greenhouse production costs and returns data be developed by major greenhouse crops namely: cucumbers, tomatoes

(NFT), tomatoes, lettuce, bedding plants, roses, cut mums, potted mums, foliage plants, and poinsettias.

Method:

Thirty-three greenhouse operations in the province were selected to obtain the information on crops. The participants were personally contacted to collect production costs and returns data. Four of the participants were unable to provide any information on their operation and two of the operations were closed because of economic reasons.

Results:

A complete report based on the survey results is expected to be published in the spring of 1984. Following are some of the general observations drawn from the data analyzed so far:

1. Gross revenue showed a considerable increase over the previous years - primarily because of better prices and some increase in production per plant.
2. Cucumbers grown in soil produced better crop (yield per plant) than those grown in pots and bags.
3. Costs of greenhouse material inputs like seed, cuttings, chemicals, fertilizers, labels and tags have increased by about 30 to 40 per cent in 1982-83 over 1979-80.
4. Greenhouse heating costs have almost quadrupled during the last three years. Gas rebate program was very timely and has helped quite a few greenhouse operations in the province. Heating costs which were 5 to 7 per cent of the operating costs in 1979-80, are now at about 20-22 per cent.
5. For some of the operations, financing costs were exceptionally high.
6. Greenhouses producing bedding plants showed higher returns than cucumbers grown alone and all of the other crop combinations.
7. The industry has shown some expansion but not enough to meet local demand for fresh produce.

ENERGY USE FOR FARM TRUCKING IN ALBERTA

Alf Birch & G. Nabi Chaudhary

Background:

Energy is one of the most important factors in agriculture. It is required for farm operations such as tillage, seeding, harvesting, and transportation of farm products and supplies. Agriculture is also heavily dependent on the indirect use of energy in the manufacture of fertilizers, pesticides, machinery and other inputs.

In view of the importance of energy in agriculture, efforts are needed to develop comprehensive and accurate information on energy supply and demand. While farm trucking is only one part of the food system, it serves an important function. Energy shortages or price increases in one part of the system can disrupt the flow in other farming operations. It is hoped that the information presented in this study will serve as a benchmark for, and tie in with future investigations of energy use in other parts of the food system.

The overall objective of the study was to describe the use of energy (fuel) by farm trucks for farm and non-farm operations. Additional specific objectives were:

1. To describe the characteristics of farm trucks in Alberta.
2. To estimate the relative magnitude of energy costs in relation to total farm trucking costs and total energy costs on Alberta farms.
3. To estimate and describe the use of commercial trucking for farm inputs and products.

Method:

Data for this study were obtained by a pre-tested questionnaire mailed to 900 farmers throughout the province. The farmers were randomly selected from the list of all owners of registered farm vehicles in Alberta. The number of useable responses returned were 201 or 22.3 per cent of the original sample size. Although this rate was low, it was considered to be adequate for analytical purposes.

Results:

The 201 respondents for this study reported 671 owned trucks. The average number of trucks per farm was therefore 3.34. There was considerable variation between farms and between regions in the number of trucks per farm reported for this study. The average number of trucks per farm ranged from 2.8 in Region IV to 4.2 in Region I. General characteristics of farm trucks in terms of gross vehicle weights, age of trucks and use of farm trucks were also studied.

According to this survey, 94 per cent of the farm trucks used gasoline, 5.8 per cent used diesel and 0.2 per cent used other fuels. This finding compared well with Alberta Motor Vehicle Branch records which showed that in 1981, 97 per cent of the vehicles used gasoline, 3 per cent diesel and a very small number used other fuels such as propane. Average fuel efficiency for gasoline trucks ranged from 44.1 L/100 km (6.4 mpg) for trucks with GVW of 14 000 kg and over to 17.3 L/100 km (16.3 mpg) for trucks with GVW of 2 000 kg or less (p. 14). The average fuel efficiency reported for diesel trucks with GVW of less than 14 000

kg in this study was 21.9 L/100 km (12.9 mpg). For the 18 diesel trucks in the over 14 000 kg class, fuel efficiency was about 40 L/100 km (7 mpg).

In addition to fuel efficiency, the major factors affecting total fuel demand for farm trucking was the annual mileage and the number of farm trucks. The average annual mileage ranged from 6 200 to 17 700 km for the different classes of trucks (P. 16). In 1975-76, total sales of farm fuel in the form of marked (purple) gasoline and diesel amounted to 533.7 million litres and 268.2 million litres, respectively. In 1980/81, marked gasoline sales had dropped to 515.2 million litres whereas diesel sales had increased to 371.5 million litres. It should be noted that the above figures do not include sales of unmarked (orange) gasoline to farms, mainly for automobile use.

The study evaluated the government assistance for farm fuel and opportunities for conservation. It suggested several conservation measures which were easy to follow (P. 31) and could result in fuel savings of 20 to 30 percent. The study also analysed the impact of changes in agricultural transportation policy on future uses of farm trucks and described the role of commercial trucking in hauling agricultural products.

AGRICULTURE TRANSPORTATION - QUARTERLY REVIEW

G. Nabi Chaudhary

The quarterly review on agriculture transportation developments and policy changes has been published since June 1976. It provides a summary of both the federal and provincial governments policy announcements and/or decisions affecting the movement of agricultural commodities between provinces and to export positions. The review also provides a list of U.S. transportation policy changes which have impact on the movement of commodities to and from Canada.

The review lists any changes and/or increases in rail and truck freight rates for major agricultural commodities for the inter and intra-provincial traffic. Rail freight rates on some of the selected commodities have been kept up-to-date since December 1974 when the freeze was lifted on rail rate increases.

Since December 1974, rail rates on grain and grain products for domestic movement have increased by 237 per cent to eastern Canada (Toronto) and by 312 per cent to Vancouver. Fertilizer rail rates for export and domestic movement have increased by over 120 per cent during the last 9 years. Rail rates on live cattle shipment from Calgary to Toronto in railway double deck cars have increased by 174 per cent from December 1974 to date. Dressed meat (fresh or frozen) rail rates have increased over 170 per cent during this period.

The quarterly "Agricultural Transportation" review is distributed to:

- Alberta Agriculture regional and district offices and senior staff at headquarters;
- Provincial and federal government agencies and departments interested in agriculture transportation;
- Farm organizations and selected private individuals.

GRAIN HANDLING AND MARKETING NEWSLETTER

G. Nabi Chaudhary

The main objective of this newsletter is to keep staff of the department and its related agencies informed on the "Post Crow" activities being undertaken by the Alberta Departments of Agriculture and Economic Development. The newsletter also provides information on "post crow" related developments at the Federal level.

The first issue of this newsletter was published in March 1983 and to date five more issues have been published. The latest issue of this newsletter was published in January, 1984 which summarized and provided the highlights of the Western Grain Transportation Act (Bill C-155), an Act to reform the Statutory Rates (most commonly known as Crows Nest Rates).

Distribution of this newsletter is at about 1,000.

IMPACT OF REFORMS IN THE STATUTORY (CROW'S NEST) RATES ON COMMERCIAL TRUCKING FOR TRANSPORTING GRAIN

G. Nabi Chaudhary, Glen Johnston & Gordon Halls

This study is a joint project between the Departments of Agriculture, Economic Development and Transportation. Terms of reference for the undertaking of this project have been completed and preliminary work has begun to gather information. The project is expected to be undertaken in two phases.

Objectives:

Objectives for Phase I are: (1) to describe the present commercial trucking activity for the transportation of grain and grain products in Alberta; (2) to determine future role of trucking in view of the closure/consolidation of country elevator facilities; (3) to determine the role of future trucking for grain transportation following changes in the Statutory Rates: (a) pay the railways (b) pay the producers; (4) to measure the effects of the proposed resolution of the Statutory Rates on the trucking of grain to inland terminals owned on ATL.

Phase II will be undertaken after the completion of Phase I. Emphasis in Phase II will be on describing the present commercial trucking activity for the transportation of grain and grain products from Alberta to B.C. for domestic use. And in determining the future role and prospects for commercial trucking to transport grain to the inland terminals and/or to the west coast ports for exports following reforms in the Statutory Rates.

Expected Results:

The study shall determine the following:

1. The development of trucking in the Alberta grain industry over the last decade. Characteristics of trucking activities, equipment employed and distances trucked.
2. Cost of trucking grain and estimated rates for future hauls.
3. Efficiency of commercial trucking versus farm trucking.
4. Regulations controlling the trucking industry and identification of any institutional constraints to efficient trucking.

5. Road network and government(s) expenditure on construction and maintenance.
6. The influence of the federal government's branch line rehabilitation program on the potential for trucking.
7. Impact on highway traffic.
8. Trucking as a complement to the railways, potentials for unit train operation, car turn-around time and other grain transportation related efficiencies.
9. The point at which truck transportation of grain becomes an economic alternative for the producer.
10. Impact of changes to the primary grain collection system on trucking and the road system.

ECONOMICS OF THREE AXLE TRUCKS FOR HAULING AGRICULTURAL PRODUCTS

G. Nabi Chaudhary

This study is being undertaken at the request of the representatives of the Alberta Sugar Beet Growers Association and Alberta Potato Commission. Both groups feel that the present system of hauling beets and potatoes by tandem and single axle trucks is costly and very time consuming. With the closure of several sugar beet receiving stations, the producers have to haul beets much longer distances than before. Similarly, long distances have to be travelled for the delivery of potatoes to the potato processing plants. In view of the situation, the farmers strongly feel that they can benefit greatly by using three axle trucks over the tandems and single trucks. However, the present legislative restrictions would not allow the use of three axle trucks because of the fear of damage to roads and bridges.

In this study attempt will be made to:

1) Describe the legislative restrictions regarding the use of three axle trucks on secondary highways and how changes can be introduced if possible;
2) Document the economic benefits of three axle trucks over tandems; and
3) Evaluate alternatives to the use of tandems and three axle trucks in order to achieve transportation efficiencies.

POTENTIAL FOR AGRICULTURAL EXPANSION RELATIVE TO FORESTRY IN NORTHERN ALBERTA

Kathleen MacDonald

Background

A basic policy of Alberta Agriculture is to maintain and expand Alberta's land base as one of the Province's most important renewable resources. The purpose of this study is to compare the economics of converting a block of forested land to agricultural use as opposed to maintaining the forest in its current state. It is not the intent of this paper to present arguments for or against any particular land use, but it should be noted that a comparison of the economics of alternate uses cannot be completely divorced from the externalities associated with the different uses.

Method

Although the study was confined to a specific land base, the parameters used for estimating agricultural and forestry coefficients were based largely on secondary data from comparable areas and conditions. Potential production for both agriculture and forestry relate to existing Canadian Land Inventory classification data or other more current information available from Alberta Agriculture and Alberta Forestry. Cost figures were based on published estimates for similar activities and were refined through the use of informed estimates from the relevant agencies involved in the industries concerned.

Results

Infrastructure costs (roads and power) for conversion to agriculture were $53 million (in 1982 dollars); access by ferry increased the costs by almost $1 million; while a bridge would cost $17 million. The cost per farm was between $106 and $140 thousand. Land clearing and tilling costs were estimated at $200 per acre or $50 million dollars for the entire project. For forestry, losses of up to $26.00 per thousand board feet were estimated for 1981-1982. For a 500 acre farm, returns over cash costs were $21,700 and net returns after depreciation were $4,000. Project analysis at a 5 percent discount rate for 250,000 acres (based on 3 to 10 year phasing-in periods), produced net present values of $18.5 to $22.1 million to farmers alone. There was however, a net discounted cost of $34.8 to $40.5 million to society. Benefit-cost ratios were 1.34 to 1.36 to farmers and 0.42 to 0.46 to society, at a 5 percent discount rate. At higher discount rates, net returns to farmers were negative and benefit-cost ratios were less than 1.00.

TOWARDS THE DETERMINATION OF AN ECONOMIC MULTIPLIER

Kathleen MacDonald

Background

The purpose of the study is to review specific estimates of economic multipliers and to calculate preliminary multipliers for Alberta. Economic multipliers provide a measure of change in total regional employment and income as a result of change in output employment and

income of a particular industry. The concept of a "multiplier effect" is based on the premise that, when output of an industry increases, payrolls increase, and industry purchases of supplies and services from other industries also increase. Workers spend all or part of their income locally, generating additional demand for goods and services and further increases in local employment and incomes. Income that is spent outside the local economy, on the import of goods and services, does not enter directly into the cycle which produces the multiplier effect on the local economy.

Method

Literature on the subject of economic multipliers was reviewed and one specific method prepared by the Department of Regional Economic Expansion presented. This method was used to calculate multipliers for Alberta. It is an economic base model, and in its short-run form, closely resembles the Keynesian model. In this form, the regional economy has a given level of productive capacity and the model is concerned with the rate of utilization of this capacity. The long-run form is used where the level of regional capacity is not fixed and becomes dependent on external demand.

Results

The provincial employment multiplier ranged from 1.71 to 4.0 depending on the proportion of local and migrant labour employed in a given project. The lower values were associated with higher levels of local labour in the basic jobs created and the higher values were associated with higher proportions of migrant labour. In the more likely cases of a mix of migrant and local labour, the overall multipliers that apply were in the vicinity of 2.00 to 2.78, indicating that an approximate multiplier value of 2 or 2.5 would be appropriate for a forestry or agriculture project. Specific values can be determined for more specific mixes of local and migrant labour.

THE IMPACT OF OBSTACLES ON FARM OPERATIONS

Ronald Desjardins

Background

This document forms one of a series of similar papers prepared at the request of the Department of Municipal Affairs for use in the preparation of the 1984 Farm Land Assessment Manual. The content of the paper however, is of broader interest, for example, to farmers contemplating reclaiming sloughs or to regional staff for assessing the inconvenience cost caused by man-made obstacles. The models developed are based on specific assumptions which should be adjusted to reflect the conditions of the particular situation being examined. Many obstacles (water, roads, wellsites, etc.) result in a loss of productive area and create an impact on the efficiency of the cropping pattern. This study measures the impact of obstacles and the relative impact of different crops on the cost of production.

Method

The first section focused on three cases: 1] No obstacle, 2] Corner location for a 25 acre obstacle, and 3] Central location for a 25 acre obstacle. One of the critical factors involved in the calculation

procedure was the operating sequence. This sequence varied with different crops, therefore four crops; wheat, barley, alfalfa and sugar beet; were selected as examples. In the second section, obstacles, including roads, ditches, sloughs and wellsites were examined. Calculations were based on the crops above as well as on rapeseed.

Results

The location of the obstacle had an impact on the cost of production. Where the obstacle was not in contact with the boundary of the field, the impact was four to nine times larger than when the obstacle was at the boundary. For the four crops studied, there was a drop in efficiency from 100% in the no obstacle situation, to a range of 96.2% to 99.4% with obstacles present. The lowest loss of efficiency occurred with a permanent or semi-permanent crop (e.g. pasture or hay crops). The smallest loss of efficiency occurred for alfalfa with the obstacle in the corner location. For the central location, the row crop was the most efficient. For a field of 155 acres, the efficiency level was in the range of 95 to 100%, but for a field of 40 acres, the efficiency level dropped to 87.7%. This relationship did not seem to hold very strongly for sloughs, since the importance of the problem was modified by the configuration of the obstacle. There was a drop of 2% in efficiency (from 89.12% to 87.16%) when the obstacle was separated into a number of sloughs as compared with a single large slough.

RANGELAND IMPROVEMENTS: PROCEDURES COSTS AND BENEFITS

Kathleen MacDonald & Samuel Stochinsky

Background

The subject of land disposition, settlement and improvement is currently of significant interest. This study forms part of the economic analysis of expansion and intensification alternatives for an inter-departmental Agricultural Land Base Study. The purpose of this study is to examine alternatives for the improvement of rangeland. Two alternatives considered deal with improvements to increase grazing capacity. The costs to the farmer are weighed against the benefits, as each of the procedures involved with improvement are considered.

Method

This study employs discounting analysis to determine the net present value, the benefit-cost ratio and internal rate of return associated with rangeland improvements. The investment costs are those related to the improvement made by the rancher and the benefits and costs measured are those of the rancher, specifically produced by the improvement (i.e. marginal benefits and costs alone are measured). Information was obtained from various government and private publications. District agriculturalists, regional farm economists, grazing reserve coordinators, resource management and range specialists were also consulted. This study deals with the improvement of rangelands through land clearing, breaking and seeding tree covered land, and reseeding of native pastures.

Results

Rangeland improvement projects are capital intensive. It would cost almost $300 an acre to turn tree covered land into productive tame grass pastures, and almost $100 an acre to reseed native pastures. Both

investment alternatives were found to be economically feasible under the assumptions adopted and the evaluation techniques used. Profitability is quite sensitive to efficiences/inefficiencies in fertilizer use and feed conversion. Capital outlay variations also affect profitability. Delays of one year in implementation would not reduce the viability of the projects, but two year delays substantially reduce profitability. The internal rates of return (IRR) for investments in clearing and in reseeding native range were 6 percent and 10 percent respectively, indicating that such investments would be feasible at real discount rates of up to 6 and 10 percent respectively. Some ranchers adopt a policy of retaining native range for a number of reasons, including the alternate or better use of limited capital, the unavailability and/or high cost of credit, restrictions of local government and neighbours, and a number of personal factors. Among the personal reasons, perhaps risk is the underlying factor in most cases, indicating the need for programs to minimize financial risk due to such factors as weather and price variations.

DRYLAND SALINITY - THE ECONOMICS OF CONTROL AND RECLAMATION

Nithi Govindasamy

Background

Dryland salinity is recognized as a major problem in Alberta contributing to soil quality and productivity losses. Estimates of the area affected range from 100,000 to 250,000 hectares. This area is thought to be expanding annually at the rate of 10 percent. This study will focus on the economic aspects at the farm level of dryland salinity control and reclamation. More specifically, the study will provide a general overview of the dryland salinity problem in Alberta; briefly examine the causes, symptoms and effects of the problem; and examine the economic feasibility of alternative control and reclamation techniques.

Method

The economic analysis of reclaiming saline soil is complicated by the varying conditions on affected sites. Several assumptions were made, based on estimates and judgements to arrive at average salinity salinity conditions on a typical farm. Data collected from a farm survey in Warner County were utilized in this process. The major benefit from the vegetative reclamation of dryland saline soils is the increase in crop yields. Several alternative structural and vegetative methods of reclamation are possible. This study identifies five such alternatives for analysis. There are few research data on reclamation rates and yield response to vegetative control measures. This study utilized research data available from Montana and informed opinions of research personnel, to calculate crop yields in each year after reclamation. The additional farm revenue resulting from increased yields was determined using average 1973-82 crop prices. The life of the project was assumed to be ten years and crop prices were indexed using Farm Prices of Agricultural Products and expressed in 1982 dollars.

Results

Preliminary results for one alternative vegetative method of reclamation indicates that it is economically feasible to undertake reclamation. Net returns to the producer [defined as returns to land,

labour, management and other investment] were approximately $80/hectare. However, initial investment costs are prohibitively high and may deter producers from instituting reclamation. Work is continuing on examining the economic feasibility of the other alternatives. The stability of all results will be examined by sensitivity analysis on crop prices, yields and discount rates.

ECONOMIC ANALYSIS OF AGRICULTURAL LIMING

Andrew Kaggwa

Background

The Economic Evaluation of Agricultural Liming in Alberta is part of the Agricultural Land Base Study. The objective of this paper is to examine the economics of liming acid soils in Alberta. There is a considerable amount of information on liming and how it can be applied as a soil management technique. Sources include field experiments, laboratory testing and economic data collection on liming in Canada and other countries.

Method

Benefit-cost analysis of liming will be carried out for representative farms in four different soil zones - Black, Dark Brown, Luvisols (in the White Administrative area) and Luvisols (in the Yellow area). These soil zones have different crop mixes, climatic conditions and different yield and economic responses to liming. The analysis is based on published information, and discussions with soil specialists, regional staff, lime suppliers and custom operators. The most severe acidic soils are found in the Peace River and central regions of Alberta. Patches are found in the cultivated area throughout the province. Increased crop yield is the appropriate indicator for measuring the direct economic benefit of liming. Other industries would benefit from the increased demand for liming material.

Expected Results

For each model farm, two cases of cost and returns will be presented; one case for production without liming and the other for production with liming. A similar crop mix will be assumed in both cases and yields of each crop for each (pH) acidic level will be differentiated. Features of a model farm are: a specific farm size by soil zone; annual costs per acre for each crop enterprise with and without liming in each soil zone; expected returns for each crop with and without liming in each soil zone; and comparisons of net benefits per crop from liming for each soil zone. The analysis will determine the potential benefits of liming acid soils to the farmer. Ultimately benefits or costs to the region and to Alberta will also be indicated from the results of the analysis.

CONVERSION OF WOODLAND TO CROPLAND ON ESTABLISHED FARM IN ALBERTA: AN ECONOMIC ANALYSIS

Alison Coyne

Background

This study has been initiated to fulfill, in part, the Branch's commitment to the economic component of the Agricultural Land Base Study.

Statistics indicate that a significant number of farms in northern Alberta report unimproved land in the form of woodland. Conversion of this land to cropland could be a means of expanding the total cultivated acres on farms in northern Alberta. The main objective of this study will be to determine the economic feasibility at the farm level of converting woodland to cropland.

Method

Analysis will concentrate on farms in the Black and Grey Wooded soil zones of northern Alberta. The average number of wooded acres per farm has been calculated for farms reporting woodland. As physical limitations make it impossible for all of this land to be brought into production, analysis will proceed based on the benefits and costs associated with certain percentages of the land being improved.

Expected Results

The study is to be completed in April, 1984.

AN INVENTORY OF CHANGES IN ALBERTA'S AGRICULTURAL LAND BASE - 1981

Peter Woloshyn

Background

This study is basically an update of the 1976-80 inventory study completed in March of 1982 by Alfred Birch. Both of these studies were undertaken to answer questions regarding the present and possible future use of Alberta's agricultural land base. Great public concern regarding agricultural land use in the late seventies and early eighties indicated that changes in land use policy might be necessary. In order that intelligent decisions can be made regarding land resource allocation, accurate information is required on how the land is being used presently. The inventory study was an attempt to fulfill part of this requirement.

Method

Numerous agencies involved in land conversions supplied raw data on a case-by-case basis. Where possible the following information was coded: legal description, CLI classification, amount of land being converted, intended use and date. These data were coded and placed on computer tape for analysis. The major categories of land conversion are: public land dispositions, abandoned oil and gas wells, reclaimed coal strip mines, subdivisions, urban annexations, roads, new oil and gas wells, coal strip mines, and public land reservations.

Results

Average annual addition to the agricultural land base during the period 1976-1980 was 77.3 thousand acres (approximately 121 sections of land), while average annual losses were 78.1 thousand acres (approximately 123 sections of land). In 1981 113.2 thousand acres were added to the agricultural land base (176 sections of land, 46 percent above the 1976-80 average). It is significant however, that dispositions leading to title were dramatically down from the 1976-80 average. Also during 1981, there were 82.6 thousand acres of land removals (about 129 sections of land, 5 percent above the 1976-80 average).

ECONOMIC ANALYSIS OF SUMMERFALLOW REDUCTION

Peter Woloshyn

Background

This study forms part of the Agricultural Land Base Study (ALBS). The economic component of the ALBS is designed to evaluate the benefits and costs of various land management and allocation alternatives. One of these alternatives is the reduction of summerfallow acreage. The purpose of this study is to evaluate the direct economic farm implications of fallow reduction using standard benefit/cost methodology.

Method

Two methods of analysis are being used; the first is a CRD (Consensus Research Data) program on visi-calc which calculates production costs and the second is a simulation model (Dryland Crop Enterprise), developed by Agriculture Canada. This model is capable of calculating production costs and returns, financial statements and requirements. Model farms with specific crop mixes, machinery complement and cultural practices have been identified for each major soil zone, based mainly on secondary data. Each model farm will be run in the simulation model over a number of years to determine on-farm benefits and costs of various crop rotations. These results will then be evaluated using benefit/cost analysis.

Results

Representative farms have been determined for each of the soil zones. Simulation runs are underway for the dark brown soil zone. The basic plan is to determine the "before" (existing rotation) labour requirements and production costs. The "after" situation (fallow reduction) will be run next and relevant costs such as labour, machinery and cash input costs (seed, chemicals, etc.) will be compared with the "before" situation. This procedure will be repeated for each soil zone. Sensitivity analysis (prices, changes in yields and discount rates) will also be done.

AGRICULTURAL REAL ESTATE VALUES IN ALBERTA

Peter Woloshyn

Background

Real estate [land and buildings] is the major portion of a farmer's portfolio. While machinery and cash input costs are significant, land has had an appreciating value and thus an increasing cost. This situation has significant implications for agricultural land users. The agricultural real estate report was initiated [in 1971 and is currently ongoing] to fill an information gap regarding the value and volume trends in agricultural real estate.

Method

The relevant information is obtained from Land Titles Office and coded on computer tape by the Department of Municipal Affairs. The information available for analysis includes: legal description; date of registration; acres transferred; CLI rating and assurance value per acre. Since the assurance fund value represents opinions of value in the real estate transfers, they are primarily proxies for average market values.

Individually the figures cannot be assumed to reflect average market, productive, capitalized or economic values. However, the trends and general geographic value differentials are felt to be well represented by this information.

Results

From 1971 through 1981, the average annual increase of agricultural real estate values was 19 percent. The acreage transferred fluctuated from year to year, possibly a result of the relative instability in the farm environment. On a provincial basis real estate values increased every year since 1971 through 1982. Those who owned real estate had an appreciating asset base which provided a more stable financial base. Many who were entering the agricultural real estate market through the seventies, primarily beginning farmers, experienced difficulty in maintaining a viable farm unit considering the high cost of land coupled with an unstable price and production regime. In 1982, agricultural real estate increased in value by 6.0 percent, well below the average annual increase of 19 percent. Total number of acres transferred in 1982 was down significantly from 19.3% in 1981 reflecting the prevailing economic conditions of 1982. The first three quarters of 1983 have shown decreases in average values per acre and increases in acreage transferred relative to 1982. The 1983 full year results will be available by February 29, 1984.

IRRIGATION WATER REQUIREMENTS IN THE SOUTH SASKATCHEWAN RIVER BASIN: ECONOMIC COMPONENT

Alf Birch & Tony Van Deurzen

Background

Water is rapidly becoming, or is already, a scarce commodity in some locations within the South Saskatchewan River Basin. The purpose of this study is twofold; to determine what minimum level of water supply is required to sustain farm income while avoiding undue economic hardship to the farmer in the long term; and to examine various factors which determine why specific areas within the study area are more conducive to irrigation farming than others and subsequently result in greater farm income. Fulfillment of these objectives will aid in identifying what pattern of water allocation is necessary to obtain maximum benefit from water used for irrigation. The study does not address economic viability from a social cost point of view.

Method

This study employed marginal economic analysis and thus relied upon the accuracy of the yield response functions provided by the agronomy component of the study. This study concentrated on determining the irrigation water requirements, by zone and sub-basin, for the principal field crops, in order to achieve various financial results for farmers. Regression equations were developed for the following crops: wheat, barley, alfalfa, sugar beets, pasture, potatoes, silage corn, canning corn, flax and beans. Most of the background information concerning the study area profile was obtained from secondary sources. For each of the four agricultural zones, five alternative water supply levels were selected and their economic impact on the farmer investigated. Probabilities of natural moisture levels of 10 and 20 percent were used with the alternative irrigation levels. Revenues were based on 1981 prices and price increases of 20% and 30% were applied to break even analysis.

Results

A range of net revenues was determined with the existing irrigated crop mix, by agricultural zones. Weighted average net revenues were consistently negative across locations and moisture levels (based on 1981 average farm values of crops and deducting costs for land, interest and labour). Incremental returns to irrigation were generally positive (based on 1981 farm values of crops and a 50% probability level of natural moisture). At price increases of 20 and 30 percent above 1981 values (and assuming both a 10 and 20 percent probability of natural moisture), net returns became positive for several irrigation levels but not in all zones. The conclusions of the study were: agricultural zones B and C have slightly lower irrigation water requirements per hectare than allotments for existing development, for at least 5 out of 10 years based on current cropping patterns; high break even irrigation water requirements appear necessary due to the historical relationship of farm prices to the costs of production; the farmer may be able to absorb losses 10 percent of the time, however, the ability to sustain financial losses beyond this level is difficult to assess and depends on the individual's equity level, type of enterprise(s), and a variety of other

factors; and the timing and the magnitude of the irrigation water supply shortfall during any year is critical.

THE ECONOMICS OF AGRICULTURAL DRAINAGE: IRRIGATED SALINE SOILS IN SOUTHERN ALBERTA

Alfred Birch

Background

Soil salinity is increasingly recognized as a serious agricultural problem in Alberta and elsewhere. Saline seepage reduces crop yields in Alberta on an estimated 200,000 hectares of dryland and 80,000 to 120,000 hectares of irrigated land. Considerable research is being undertaken in various locations on salinity control and reclamation. However, relatively little work has been done on costs and returns to saline soil reclamation. This study provides a general economic analysis of the drainage reclamation of irrigated saline soils.

Method

The economic analysis of saline soil reclamation is complicated by the presence of many factors which vary from one site to another. Therefore, several simplifying assumptions were made, based on estimates and judgements of average conditions. The major benefit from the drainage and reclamation or irrigated saline soils is the increase in crop yields. The reclamation rate, after drainage installation, was calculated using research data and combined with yield response functions to calculate crop yields in each year after drainage installation. The additional farm revenue resulting from increased yields over the life of the drainage project (30 years) was then calculated, using average crop prices [1972-81, expressed in 1981 dollars]. Calculations were based on three levels of salinity and in three Irrigation Districts.

Results

Sub-surface drainage reclamation of small saline and waterlogged sites under irrigation was shown to be economically feasible. The net present value of an investment in drainage installation ranged from approximately $300 to $800 per hectare. This represented the net returns to management, labour, land and other investments, after deducting drainage installation costs. The stability of these results was examined by varying the reclamation rates, crop prices, drainage installation costs and the discount rate. In all cases, the project proved to be financially feasible. The main recommendations of the study were to continue and expand the current salinity control program; continue providing technical assistance to farmers in saline soil reclamation; focus further attention on financial assistance to farmers to promote reclamation; and provide a strong extension effort to promote reclamation.

PRODUCTION AND RESOURCE ECONOMICS PUBLICATIONS

PRODUCTION ECONOMICS PUBLICATIONS

DAIRY

- "Economics of Milk Production in Alberta" - 1941 - present (name was changed in 1977 from: Dairy Farm Business Summary).
- "Economics of Industrial Milk Production" - 1977.
- "Cheese Factory Feasibility - Transportation Aspects" - 1975.
- "Cost of Production of Fluid Milk in Alberta and Examination of the Milk Pricing Formula" - 1975.
- "Alberta Milk Pricing Formula Revision" - 1979, 1979 (supplement), and 1980.
- "Dairy C.R.D.'s"
- "A Comparison of Milk Pricing Methods by Provinces" - December, 1980.
- "Economic Efficiency of Alternative Milking Systems" (in progress).

POULTRY

- "Economics of Heavy Turkey Production in Alberta" - 1983 (in progress).
- "Economics of Broiler Production in Alberta" - 1983 (in progress).
- "Economic Analysis of Egg Production in Alberta" - 1983 (in progress).

LIVESTOCK

- "Sheep Production Cost Study" - Edmonton Region 1976.
- "Beef Confinement Barns in Alberta" - June, 1978 (joint study with Neal Oberg, Farm Business Management Branch).
- "Confinement Beef Barns in Western Canada" - July, 1980.
- "Potential Areas For Increasing Beef Cattle Feeding Efficiency in Western Canada By 1990" - November, 1979.
- "Economics of Feeding Cattle in South Central And Southern Alberta" - August, 1980.
- "Economics of Feeding Cattle in North Central and Northern Alberta" - August, 1981.
- "Economics of Hog Production in Alberta" - 1980.
- "Economics of Farrow-Finish Hog Production in Alberta" - 1981.
- "Economics of Finishing Hog Production in Alberta" - 1981.
- "Economics of Farrow-Finish Hog Production in Alberta" - 1982 (in progress).
- "Economics of Finishing Hog Production in Alberta" - 1982 (in progress).
- "Economics of Sheep Production in Alberta" - 1982, and 1983 (both in progress).

CROPS & LIVESTOCK

- "The Alberta Regional Farm Enterprise Research Project - Vermilion Region" - 1978, 1979, 1980, 1981, and 1982 (in progress).
- "The Alberta Regional Farm Enterprise Research Project - Barrhead Region, 1980, 1982.

CROPS

- "Forage Harvesting Systems - Economic Alternatives For Alberta Farmers" - March, 1978.
- "A Cost Comparison of Conventional Implements, Airseeders and Aircraft for Seeding, Spraying and Fertilizing" (in progress).
- "Summary Reports of 1982 Crop Production Cost Case Studies for Alberta" (in progress).

SPECIAL CROPS

- "Fababeans" - 1974.
- "The Economics of Sugar Beet Production in Alberta" - 1975, 1976, 1977.
- "The Economics of Sugar Beet Production" - 1982 (in progress).
- "The Economics of Production and Marketing of Greenhouse Crops in Alberta" - 1979/80.
- "The Economics of Production and Marketing of Greenhouse Crops in Alberta" - 1982/83 (in progress).
- "Dryland Special Crops in Southern Alberta" - 1980.
- "Irrigated Special Crops in Southern Alberta" - 1980.
- "Analysis and Implications for the Development of the Alfalfa Processing Industry in Alberta" - Contributed a Section on "Transportation and Handling of Alfalfa Products" - November, 1974.
- "Procurement and Distribution of Vegetables in Alberta" - A Study of Production Contracts, Transportation and Storage of Vegetables in Alberta - 1974/75; January, 1976.
- "Handling and Transportation of Flowers, Fruit and Vegetables in Alberta" - December, 1979.
- "The Economics of Production and Marketing of Greenhouse Crops in Alberta" - April 1980, and May 1981.
- "Cost Analysis of Potato Storage Facilities in Alberta" - January, 1983.
- "The Economics of Potato and Vegetable Production in Alberta" - 1980, 1981.
- "The Economics of Vegetable Production (selected crops) in Alberta" - 1982.

TRANSPORTATION

- "The Cost of Transporting Grain by Farm Truck in Alberta" - 1977.
- "Agriculture Transportation Newsletter" - Quarterly (Started June, 1976).
- "Grain Handling and Marketing Newsletter" - published periodically since March 1983.
- "Impact of Reforms in the Statutory (Crow's Nest) Rates on Commercial Trucking For Transporting Grain" - (joint project, in progress).
- "Motor Truck Transportation of Grain to Inland Terminals in Western Canada" - May, 1975.
- "The Cost of Transporting Grain by Farm Truck in Alberta" - August, 1977.
- "Economics of Three-Axle Trucks For Hauling Agricultural Products" (in progress).

MISCELLANEOUS

- "Farm Machinery Costs Report" - updated every 2 years.
- "A Method For Making Investment Decisions On The Farm" - June 1980.
- "Economics of Feed Storage and Distribution Systems For Feeding Cattle" - July 1980.
- "Economic and Environmental Considerations in Evaluating Alternative Manure Management Systems" (in progress).
- "Greenhouse Tax Structure in Alberta" - 1979.
- "Economic Evaluation of Irrigation Systems" - 1979.
- "An Economic Comparison of Wintering and Package Bees in the Peace River Region" - 1983.
- "The Economics of Honey Production in Alberta" - 1980.
- "The Economics of Beekeeping in Alberta" - 1981.
- "Energy Use For Farm Trucking in Alberta" - June, 1983.

CONSENSUS RESEARCH DATA REPORTS (CRD's)

- Reports on costs and returns of various commodities (crops and livestock) by regions. 1972 - present.

RESOURCE ECONOMICS PUBLICATIONS

WATER RESOURCE MANAGEMENT - (WRM)

- "Irrigation in Alberta" - 1977.
- "Economic Evaluation of Irrigation in Alberta".
- "Management of Water Resources Within The Oldman River Basin".
- "A Conceptual Framework For Economic Analysis in Southern Alberta".
- "Benefit Incidence From Irrigation Rehabilitation at Three Locations".
- "Irrigation in Alberta" - 1982.
- "Irrigation Water Use in Alberta".
- "Irrigation Water Requirements in the SSRB: An Economic Perspective".
- "Irrigation: The Alberta Experience".
- "Costs and Benefits of On-Farm Surface Drainage in North-Central Alberta".
- "The Economics of Agricultural Drainage: Irrigated Saline Soils In Southern Alberta".
- "The On-Farm Usability of Farm Surface Water (in progress).

AGRICULTURAL COMPENSATION - (AC)

- "Wellsite Spacing Issues".
- "An Overview of Compensation for Wellsite Leases in Alberta".
- "Wellsite Spacing Pattern: An Agricultural Perspective".
- "Assessment of Impact of Increased Number of Wellsites Per Unit of Land".
- "Financial Evaluation of Compensation Methods for Powerline Easements".

- "Compensation Payments".
- "Assessment of Effects of Powerlines".
- "Effects of Wellsite Spacing on Agriculture".
- "Possible Impact of Pipeline Construction on Farmland".
- "The Impact of Obstacles on Farm Operations".

LAND RESOURCE MANAGEMENT - (LRM)

- "Farming in the Edson Peers Area".
- "Farming in the Lone Pine Fort Assiniboine Area".
- "Farming in the Little Smoky Study Area".
- "Farming in the Big Bend Study Area".
- "Geographical Locations in Alberta".
- "Environmental Constraints and Land Management".
- "Integrated Management Plan - Castle River".
- "Agricultural Concerns in the Livingstone-Porcupine Hills Planning Area".
- "Farming in I.D. #23
- "Farming Activities in I.D." #15" & #16.
- "Proposed Annexation Plan - Beef".
- "Farm Development in the Lower Peace River Area".
- "Alberta Surface Land Area 1979".
- "Farm Development and Public Land Disposition".
- "Changed Number of Farms in Alberta".
- "Agricultural Use of Smallholdings in the Battle River Region".
- "Simulated Dryland Crop Production on Irrigated Land in Southern Alberta".
- "The Economic Implication of Liming/Not Liming Acid Soils in the Peace River".
- "Relocation of Arable Topsoil".
- "Does it Pay to Lime Acid Soils in Alberta?" (Peace River).
- "Farming Potential of the Jean D'or Prairie Area: An Economic Assessment".
- "Agricultural Impact of 80-Acres Parcel Creation in M.D. of Sturgeon".
- "Concept of Soil Conservation/Land Use & Resource Evaluation".
- "Agriculture - Our Renewable Resource".
- "Inventory of Changes in Alberta Agricultural Land Base Between 1976 & 1980".
- "Potential For Agricultural Expansion Relative to Forestry in Northern Alberta".
- "Inventory of Changes in Agricultural Land Base".
- "The Effect of Adverse Topography on Farm Costs and Income".
- "The Impact of Hills on Farming Operations".
- "Impact of Obstacles on Farm Operations".
- "Cost of Stone Picking For Farmland Development in Alberta".
- "Cost of Tree Clearing For Farmland Development in Alberta".
- "Rangeland Improvement Procedures: Costs and Benefits" (in progress).
- "Towards the Determination of an Economic Multiplier" (in progress).
- "Dryland Salinity-The Economics of Control and Reclamation" (in progress).
- "Economic Analysis of Summerfallow Reduction" (in progress).
- "Economic Analysis of Agricultural Liming" (in progress).
- "Conversion of Woodland to Cropland on Established Farms in Alberta: An Economic Analysis" (in progress).

REAL ESTATE - (RE)

- "Agricultural Real Estate Values in Alberta" - annual.
- "Financing the Transfer of Farmland in Alberta".
- "Foreign Investments: Developments & Implications".
- "Real Estate Value Check 1977".
- "1977 Agricultural Real Estate Values in Alberta".
- "Land Values as it Related to Production".
- "Irrigation Real Estate Values".
- "Farm, Ranch & Acreage Property".
- "An Economic Primer For Understanding Agricultural Real Estate Values".
- "Agricultural Real Estate Value Check 1980".
- "Ten Year Review of Real Estate Values".
- "Agricultural Real Estate Values Quarterly Report" - 1982/83.
- "The Impact of the Location on the Value of a Property".
- "Alberta Agricultural Real Estate Situation" - 1983.
- "Agricultural Real Estate Values Quarterly Report" Fourth Quarter, 1983 (in progress).

AGRICULTURAL RESEARCH TOPICS - (AR)

- "Agricultural Research Projects 1977".
- "Directory of Agricultural Research in Alberta 1977".
- "Farming for the Future, Research Priorities".
- "Agricultural Research and Development".
- "Agricultural Research and Development in Alberta 1978/79".

ENERGY - (E)

- "The Role of Energy in Future Economic Development".
- "Petroleum Fuel Use By Primary Agriculture in Alberta 1975/76 - 1979/80".

N.L.C. - B.N.C.
3 3286 05322750 6